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Effect of aerobic exercises along with core stability exercises on premenstrual symptoms in college going girls: A combined study

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Abstract

Background: Up to eighty percent of females experience at least one premenstrual symptoms during their menstrual cycle. Females with PMS report a poorer perceived work related quality of life in their professional lives and health quality of life and PMS may result in depressed mood and greater psychiatric comorbidity. Premenstrual symptoms are characterized by emotional, behavioural and physical symptoms that occur during late luteal phase of menstrual cycles and relieved after the onset of menstruation. Aerobic exercises and core stability exercises are ways to reduce the symptoms.

AIM: To study the Effect of aerobic exercises along with core stability exercises on premenstrual symptoms in college going girls.

Methodology: This study consist of 80 females participants with premenstrual syndrome age between 18 to 25 years. They were screened by minimal investigation and 80 participants were selected based on the premenstrual syndrome scale. In this study participants were divides into two groups, group A and group B. The group A received aerobic exercises and group B received aerobic along with core stability exercises. One group was treated with aerobic exercises four times a week and other was given aerobic along with core stability exercises twice a day for thrice in a week with duration of 6 weeks

Results: Data were analysed by paired-unpaired t test by using software instant. Analysis of premenstrual syndrome scale and VAS scale shows statistically significant differences however results shows both groups are effective in reducing the symptoms but combined effect of aerobic along with core stability exercises shows significant improvement in terms of reducing physical symptoms.

Conclusion: The study showed that all two groups experienced significant reductions in PMS symptoms after 6 weeks of program. However result shoed that combined effect of aerobic along with core stability exercises showed significant improvement in reducing the symptoms.

Keywords: Aerobic exercises, core stability exercises, premenstrual symptoms

Introduction

Puberty is characterized by the transition from childhood to adulthood and sexual maturation. Hormonal, psychological, cognitive and physical changes take place at same time during puberty. The onset of menstruation is one of the most significant physiological changes that occur in adolescent girls [1].

Menstruation is shedding of the lining of the uterus (endometrium) accompanied by bleeding and lasts for 24 to 38 days. Only in 15% to 20% of women have cycles that are exactly of 28 days. The average age of menstruation is considered to be between 12 and 13 years [2].

Premenstrual symptoms are a combination of physical and emotional symptoms that many women get before one week of their period and lasts for 2 to 4 days after the onset of menstruation to the point that hinders with normal life. It is described as “the recurrent recurrence in the luteal phase of menstrual cycle of a combination of painful physical, psychological and Behavioral changes that are severe enough to lead to deterioration in normal activities. Premenstrual dysphoric disorder is more severe form of the same which has been included as a psychiatric disorder in the fifth edition of the diagnostic and statistical manual for mental disorder [3].

Premenstrual symptoms have an unknown origin. The initialization of the PMS is still mysterious however high salt diet, caffeine, alcohol and increased stress seems to make the intensity of these symptoms.

Decreasing use of salt, diet changes, reducing caffeine and stress, alcohol along with calcium and vitamin D supplements may help in reduction of PMS. As premenstrual symptoms appear at the same time as menstrual cycle hormonal variations like excess estrogen and low progesterone have been suggested as possible causes Serotonin is linked with symptoms as a significant etiological factor. An increase in prolactin level, glucose metabolism alterations, abnormal hypothalamic pituitary adrenal axis function, insulin resistance have role in PMS. According to epidemiological research, between 80% to 90% of women exhibit one premenstrual symptom, nevertheless in between 2.5% to 3% of women, the illness is severe enough to interfere with daily activities and social interaction. The global prevalence of women in reproductive age who experiences premenstrual symptoms is 47.8%. About 20% of these women suffer symptoms that are severe enough to interfere with daily activities with rest women experiencing mild to moderate symptoms [4, 5].

Up to 80% of females experience at least one premenstrual symptoms during their menstrual cycle, but are still able to function normally at work and at home. Premenstrual dysphoric disorder (PMDD) is a severe, sometimes disabling variant of premenstrual syndrome. Females with PMS report a poorer perceived work related quality of life in their professional lives and health related quality of life and PMS may result in depressed mood and greater psychiatric comorbidity. Severe menstrual symptoms can significantly impact the quality of life of the affected women. Interfering with school, employment, interpersonal relationships, family, social life and lead to increased healthcare utilization, decreased occupational productivity and absence from work [6].

PMS affected female employees report lower level of job satisfaction and professional well-being as well as increased stress at work and difficulty juggling work and family obligations. They also report feeling less involved in work related decisions and less satisfied with their working condition. The physical symptoms of PMS include constipation, acne, headache, weight gain, nausea, vomiting, breast soreness, dullness, exhaustion, abdominal cramps, body pain and back pain. The psychological and Behavioral signs of PMS include sleepiness, aggressiveness, irritation, panic attacks, food cravings, difficulty in focusing, disorientation, anxiety and tiredness [5, 7]. The severity and timing of this collection of symptoms varies per women. There are other external factor such as stress and illness which could also exacerbate symptoms. For example, a woman may experience bloating and cramps several days before menstruation while symptoms of irritability and anxiety could manifest on the day of menstruation. Add in an external stressor such as exam and big work deadline and it her symptoms could manifest, or the present symptoms could worsen. Proper identification of symptoms and monitoring well-being throughout the menstrual cycle is a key for optimal female health as PMS had been associated with decreased health related quality of life [8].

The most often used treatment for PMS are selective serotonin reuptake inhibitors, anxiolytic agents, gonadotrophin releasing hormone agonists, the diuretic spironolactone, NSAID'S and combination of oral contraceptives but they have number of undesirable side effects including breast tenderness, intermenstrual bleeding, sleepiness, dizziness, hearing and vision abnormalities. Considering this side effects physical therapy such as aerobic

exercises along with core stability exercises are used to minimize these symptoms along with dietary and nutritional modifications, massage therapy, yoga to treat PMS.

The effect of physical activity on menstrual cycle characteristics and found that physical activity considerably recuperates menstrual disorders. Various researches, analysis and experimentations prove that physical activity surprisingly evades the physical and psychological symptoms experienced during PMS [9].

Although the exact mechanism by which exercises lessens PMS symptoms is still unknown but research suggest that it helps to regulate the hormone imbalances that women bodies experience during reproductive cycle. Exercising for three months has the impact of treating PMS and it was discovered that exercises actually has potential to alleviate PMS psychological as well as physical symptoms as exercise increases the release of several neurotransmitters and also act as a distraction from unwanted thoughts and encourage thinking positively so lowering depression and improve mood and Behavioral. Hence exercise has been shown to reduce chronic pain and swelling and has been suggested to be effective in reducing PMS [3].

Aerobic exercise reduces negative impact on women who exercises regularly. A rhythmic physical activity that involves large muscle group sustained for 30 min or more is referred to as aerobics. Aerobic exercises are the exercises which improves oxygen consumption by large muscle group. Aerobic means "With oxygen" and refers to use of oxygen body's metabolic or energy generating process. It is a type of physical activity that combines stretching, strength training and rhythmic movement [7]. A person's aerobic capacity characterized as the capacity to efficiently take in, transport and use oxygen. Since aerobic fitness involves so many important organs and systems, it provides valuable health information. Therefore, when aerobic fitness is high, physical and mental health are improved. Addition to these aerobic exercises not only increase breathing and blood flow but also lowers body weight, lower risk of heart diseases, improves mental health stability and strengthens bone, tendon and muscles. Exercises is performed at moderate level of intensity over a longer period of time to improve CVS and it includes walking, swimming, jogging, running, rowing, stepping, dancing, climbing and so on [8].

Core training has become a common exercise in rehabilitation as well as in fitness. Core strengthening exercises enable the isolation and development of core muscle groups, thereby training them to withstand daily stresses associated with biomechanics even while the body is under strain of menstrual cycle. According to one definition "core" is a box with abdominals and diaphragm serve as the front, paraspinal and gluteal are the back and the muscles of pelvic floor and hip girdle as bottom. The core has received special attention because it act as a muscular corset that stabilizes as a whole to stabilize the body and spine, with and without limb movement [9]. Core stability, strength and endurance are the most important core abilities that ensure spine stability for force production and injury prevention. Core strength refers to the muscular ability to stabilize the spine through contractile forces and intraabdominal pressure, activity controlling spine stability through co activation of the trunk muscles, core muscles that allow optimal support and move extremities [10].

Hence exercising on regular basis has seen to be beneficial in different ways so present study aim to see the combined effect of aerobic exercises along with core stability exercises in reducing the symptoms of PMS.

Method

The study received ethical clearance by institutional ethical committee of Dr. APJ Abdul Kalam College of Physiotherapy. Study was conducted for 6 Months. Total of 80 participants had participated in the study. The Inclusion Criteria were a follow: Those willing to participate and give consent for study. Females of age between 19 to 25 years. Having regular menstrual cycles. Changes initiate from 6 days prior to cycle and lasts for 2 to 4 days after onset of menstruation. Moderate to severe symptomatic score on PMS scale. Regarding Exclusion Criteria: Not able to tolerate physical exercise, Irregular menstrual cycle. Gynaecological surgery, Pregnancy. Total 80 participants were included and written consent was taken then baseline data was collected. Participants were selected based on the premenstrual syndrome scale. In this study participants were divided into two groups, group A and group B. The group A received aerobic exercises and group B received aerobic along with core stability exercises. One group was treated with aerobic exercises four times a week and other was given aerobic along with core stability exercises twice a day for thrice in a week with duration of 6 weeks. The study was conducted for 4 weeks. Pre-test was assessed using visual analogue scale, premenstrual syndrome scale. Both the group A and B were provided with 30 to 45 minutes once in a day for thrice in a week for 4 weeks. On the last day post-test assessment of level of premenstrual syndrome was done by using VAS and, Premenstrual syndrome scale.

Aerobic exercise for group A according to ACSM guidelines

Exercise consisted of three phases

Warm up period (for 10 min) which consist of head movement, neck flexion, extension, side flexion. Rotation, shoulder shrugging, wrist movements, hand rotation, trunk forward, backward sideways from standing position movement, ankle ROM, stretching of neck, biceps, triceps, TA, hamstring, quadriceps which was hold for 20 seconds with 5 times. Interval training (for 30 min) which consist of aerobic Zumba dance for 10 min including single step touch. Double step touch, step touch front and back, marching, knee lift, jumping jacks, forward-backward walk, side lunge, reachouts. Treadmill for (10 min) and then (10 min) stair climbing (step up and down). Subjects were prohibited from aerobics during menstrual cycle. Cool down period for (10 min) consist of slow marching, slow v step and stretching.

Core stability exercises for group B

Bicycle crunches, abdominal curl up, standing trunk rotation, side bend, pelvic bridging, mountains climbing, plank, cat and camel, prone twist, bilateral SLR performed in 20 reps in 2 sets with 10-15 seconds rest, thrice a week. All 80 participants completed one month of intervention in both the groups. The result of study was recorded in terms of VAS and PMSS pre post intervention were compared.

Outcome measures

Visual analogue scale: It is pain rating scale and score are based on self-reported measures of symptoms that are recorded with a single handwritten mark placed at one point along the length of 10 cm line that represents two ends of the scale “no pain” on the left end (0 cm) of the scale and the “worst pain” on the right end of the scale (10 cm) measurements are recorded in centimeters.

Premenstrual syndrome scale: It is used to measure severity of PMS symptoms and consist of nine subscales and 44 items (depressive mood, anxiety, fatigue, irritability, depressive thoughts, sleep changes, appetite changes, and swelling) and ranking from 1-5, as 1 = “Never”, 2 = “rarely”, 3 = “sometimes”, 4 = “very often”, and 5 = “always”/ extreme changes. The lowest score is 44 and highest is 220.

Results

Statistical Analysis was carried out using INSTAT Software and P value 0.05 is considered as level of significance. Unpaired ‘t’ test was applied to analyse the data.

Table 1: comparison of pre-post intervention of VAS of both the groups

Groups	Pre Intervention Mean \pm SD	Post Intervention Mean \pm SD	Mean Difference	T Value	P Value
Group A	7.55 \pm 0.7828	6.025 \pm 0.8912	1.525	19.071	< 0.0001 significant
Group B	7.575 \pm 0.7808	5.05 \pm 0.5524	2.525	22.314	< 0.0001 significant

Table 2: Comparison of pre-post intervention of PMSS of both groups

Groups	Pre intervention Mean \pm SD	Post intervention Mean \pm SD	Mean difference	T-Value	P-Value
Group A	123.15 \pm 13.339	112.95 \pm 14.756	10.2	24.41	< 0.0001 Significant
Group B	127.98 \pm 10.899	106.3 \pm 14.957	21.675	26.588	< 0.0001 Significant

Table 3: comparison of mean difference of VAS of both groups

Groups	Mean difference
Group A	1.525
Group B	2.525

Discussion

The current research was carried out to investigate the influence of aerobic along with core stability exercises on premenstrual symptoms in college going girls. The individual were subjected to four week of intervention. The aerobic training consist of three phases warm up, intervention period and cool down period which consist of stretching for 10 min followed by treadmill walking, static bicycle and followed by 10 min cool down period. On the other hand core stability exercises consist of pelvic bridging, curls up, abdominal twisting, planks for thrice a week. The present study evaluate the effect of aerobic exercises along with core stability exercises on premenstrual symptoms which was conducted in PIMS. Total 40 participants with age between 18 to 25 years were included according to inclusion and exclusion criteria. One group was treated with aerobic exercises four times a week (N=40) and other group was given aerobic along with core stability exercises (N=40) in which individual was suggested to perform aerobic thrice in a week and core exercises twice a day for thrice in a week. Comparison in pain intensity (VAS), PMSS within the groups at baseline and post treatment of treatment was carried out. VAS and PMSS assessed after 4 weeks of treatment and was compared between two groups using unpaired t test. The obtained t value for VAS observed was 60.997 and for PMSS observed was 24.41 for group A. Obtained t value for VAS observed was 61.36 and for PMSS was 26.588 for group B is found to be significant at $p < 0.001$. The results revealed significant

reduction in pain intensity and PMS symptoms in both groups but study highlighted that aerobic along with yoga is more effective to decrease symptoms. Physical activity reduces the stress level in our body because the individual indulge itself in a physical activity, the brain starts to produce beta endorphins which reduce depression and others psychological symptoms in females. The relation of physical activity and exercise to mental health and found that exercises are beneficial in treating psychological symptoms like stress, anxiety, depression and other symptoms many women reported more self-confidence and increased social activities with the remarkable improvement in their social skills such as exercises increase the neurotransmitters endorphins which are the body natural paracetamol. It also reduces the level of adrenal cortisol and helps an individual to focus and concentrate on it's to do upcoming while mending the mood swings. The effect of exercises is similar like meditation and massage therapy as it helps to alleviate our mental health. The potential mechanism behind aerobic exercises is that it influences abdominal cramps, fatigue, bone mineral density by an increase in blood circulation, physical activity and bone health and also maintains the BMI and improve our cardiovascular activity by improving oxygen carrying capacity of blood to muscles. Core stability exercises help to stabilize the core and helps to strengthen the spine and abdominal muscles which helps to reduce pain experienced by most of the females. The benefits of having a strong core include injury prevention, reduction of back pain, improve body mechanics, posture, balance and stability. Hence combine effect of aerobic along with core stability exercises helps in to reducing the physical symptoms. Various studies indicated that aerobic exercises and yoga decreases the symptoms of PMS and controlling the nervous system. This study supported the study conducted by Vishnupriya and Rajarajeswaram, 2011 studied the effectiveness of aerobic exercises at different intensities in the management of PMS and concluded that moderate intensity aerobic exercises should be encouraged as a potential measure for PMS. It is said that aerobic exercises raises serum progesterone levels which may give positive benefits to alter mood and decrease stress via neurotransmitters. The significant release of endorphins during exercises has been found to be associated with reduction in pain, anxiety, depression in PMS. At Iran in 2016 Zahra Mohebbi Dehnavi, Farzaneh Jafarnejad was conducted study to determine the effect of 8 weeks of aerobic exercise on severity of physical symptoms of premenstrual syndrome. This study was a randomized clinical trial that was performed on 65 students. Samples were randomly assigned to control and intervention groups. The intervention group engaged in 8 weeks of aerobic exercises, three times a week and 20 min for each session. Conclusion is that aerobic exercise is one of the ways to treat premenstrual syndrome can reduce the physical symptoms of syndrome. Nirav Vaghela, Daxa Mishra stated that both aerobic and yoga movements are effective in treating PMS, however yoga is more effective in relieving symptoms of PMS than aerobic exercise. They enrolled 72 participants of PMS into two groups by simple computerized randomization. Patients in group A received aerobic and B received yoga movements for 40 min, 3 times a week for one month. The pain intensity and PMS scale were measured before, at the end of 15 days and one month of treatment programmed.

On the other hand, current study showed that aerobic along with core exercise significantly improved the behavioural symptoms of PMS such as food cravings, insomnia,

overeating, and feeling of confusion. It has been shown that PMS affects the quality of life. Women with PMS may see negative effects of PMS at their job or school performance, relationship with colleagues and friends and family responsibilities. In current study subject expressed that quality of life improved by doing aerobics along with core stability exercises. Since PMS without treatment can cause problems and affect quality of life of women, it is essential to look for tools and treatments that can relieve symptoms of PMS that are affordable in individual. The results showed that aerobic along with core stability exercises are effective approach for decreasing symptoms. Therefore, core stability exercises are recommended for women with PMS as it does not have any side effects and is safe. Women can do easily by themselves at any time and any place.

Conclusion

The Present Study Concluded That PMS symptoms are frequently detected in majority of the females. Aerobic exercises and core stability exercises both are fruitful and positive approach in reducing the signs and symptoms of premenstrual syndrome. However, combined effect of aerobic along core stability exercises were more beneficial in relieving the symptoms of PMS compared to the aerobic exercises alone.

References

1. National Research Council (US) and Institute of Medicine (US) Forum on Adolescence; Kipke MD, editor. Adolescent Development and the Biology of Puberty: Summary of a Workshop on New Research. Washington (DC): National Academies Press (US); c1999.
2. Stanford Children's Health. Menstrual Cycle: An Overview. [Internet]. Available from: <https://www.stanfordchildrens.org/en/topic/default?id=menstrual-cycle-an-overview-85-P00553>
3. Vaghela N, Mishra D, Sheth M, Dani VB. To compare the effects of aerobic exercise and yoga on Premenstrual syndrome. *J Educ Health Promot*; c2019, 8.
4. Gudipally PR, Sharma GK. Premenstrual syndrome. In: StatPearls [Internet]. StatPearls Publishing; c2022 Jul 18.
5. Çitil ET, Kaya N. Effect of pilates exercises on premenstrual syndrome symptoms: A quasi-experimental study. *Complement Ther Med*.
6. Tsai SY. Effect of yoga exercise on premenstrual symptoms among female employees in Taiwan. *Int J Environ Res Public Health*. 2016 Jul;13(7):721.
7. Kaur GU, Gonsalves L, Thacker HL. Premenstrual dysphoric disorder: A review for the treating practitioner. *Cleve Clin J Med*. 2004 Apr;71(4):303.
8. Sanchez BN, Kraemer WJ, Maresh CM. Premenstrual Syndrome and Exercise: A Narrative Review. *Women*. 2023 Jun 20;3(2):348-64.
9. Tiranini L, Nappi RE. Recent advances in understanding/management of premenstrual dysphoric disorder/premenstrual syndrome. *Fac Rev*; c2022, 11.
10. Dolde EJ. The effects of yoga and aerobic exercise on concentration and feeling-states [Honors thesis]; c2011.
11. Vishnupriya R, Rajarajeswaram P. Effects of aerobic exercise at different intensities in premenstrual syndrome. *J Obstet Gynecol India*. 2011 Dec;61:675-82.
12. Akuthota V, Nadler SF. Core strengthening. *Arch Phys Med Rehabil*. 2004 Mar;85(3 Suppl 1):S86-92.
13. Mahmoudi F, Sheikhhoseini R, Shahrjerdi S. Effect of

- core stability exercises on primary dysmenorrhea: a randomized controlled trial. *J Mod Rehabil.* 2019 Apr 1;13(2):113-22.
14. Saglam HY, Orsal O. Effect of exercise on premenstrual symptoms: A systematic review. *Complement Ther Med.* 2020 Jan 1;48:102272.
 15. El-Lithy A, El-Mazny A, Sabbour A, El-Deeb A. Effect of aerobic exercise on premenstrual symptoms, haematological and hormonal parameters in young women. *J Obstet Gynaecol.* 2015 May 19;35(4):389-92.
 16. Akyuz YE, Kartal AY. The effect of diet and aerobic exercise on Premenstrual Syndrome: Randomized controlled trial. *Rev Nutr.* 2019 Aug 19;32.
 17. Safarzadeh A, Zare S, Yousefabadi SR, Ghoreishinia G. The relationship between Exercise and premenstrual syndrome. *Int J Med Res Health Sci.* 2016;5(9):183-9.
 18. Dehnavi MZ, Jafarnejad F, Goghary SS. The effect of 8 weeks aerobic exercise on severity of physical symptoms of premenstrual syndrome: A clinical trial study. *BMC Womens Health.* 2018 Dec;18(1):1-7.
 19. Trostdorf DLTA, Moreira EC, Oliveira DJM, Grotti JE, Zago LC, Macedo CD. Impact of physical activity and sport on the symptoms of menstrual and premenstrual periods. *J Womens Health Dev.* 2021;4(4):123-35.
 20. Noor S, Norfitri R. The changes of premenstrual symptoms after aerobic exercise intervention. *J Ners.* 2015 Apr 1;10(1):38-47.